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### CREDÉ'S METHOD FOR THE PREVENTION OF PURULENT OPHTHALMIA IN PUBLIC INSTITUTIONS.<sup>1</sup>

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**I**N ORDER to appreciate the importance of this subject it is necessary to recall very briefly the number of persons in this country who have been made blind by purulent ophthalmia of infancy, and also to estimate their cost to the State. In 1890 there were in the United States 50,411 blind persons of all ages. Now it will be remembered that Magnus and others who have studied carefully the causes of blindness among several thousand individuals of all ages found that in about 10.8 per cent. this condition was due to ophthalmia neonatorum. Or, if we call that 10 per cent. for the sake of moderation, we have in this country, in round numbers, at least 5,000 persons blind from that disease. If the average cost of these per capita is about that of paupers, that is, about \$125 per year, this means that the country expends for them about \$625,000 annually. Now if it were possible within one generation to reduce the number of those blinded by the dis-

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ease in question from 5,000 to less than 350, and then indirectly to only 15 or 20, by the invariable use of one remedy which could be used by any intelligent nurse—and which is, practically, perfectly safe—then it would seem worth while to use that one remedy invariably, at least until there was reason for changing to a better one. Or, on the other hand, if, by not using this remedy an unnecessary cost were imposed upon the State, to say nothing of the suffering of the victims of such negligence, it would seem that it was the right and duty of the State to enforce such treatment.

The first object of this paper is to show that the application of a single drop of a two per cent. solution of silver nitrate to the eyes of children as soon as possible after birth, as recommended by Credé, is the best means thus far known of preventing this purulent ophthalmia of infants, and that a large experience shows that when no such precautions are taken, about fifteen times more children develop that disease than when the silver nitrate is used. It is not contended here that this treatment should be enforced invariably in private practice—however strong the reasons for that may be—but only some reasons are given why, in all institutions supported by public funds, this should be made obligatory either by special State law, or by local regulation.

As to the first question, concerning the comparative value of silver nitrate and of other remedies, that is not a matter of theory, but simply a question of fact established by the combined experience of a large number of obstetricians whose unusual opportunities for observation, both in institutions and elsewhere, have made them most competent to speak on this point. Of all the numerous statistics and published opinions which have been gathered at various times by different authors the most recent and complete lists relating to this important matter were published last year in the *Archiv für Gynäkologie* by Kostling, of Halle.

The accompanying table is made from his lists, with one or two additions, and includes all of the writers who state the number of children who came under their observation and also the percentage of those who developed ophthalmia of infancy.

TABLE I.—Statistics Concerning the Frequency of Purulent Ophthalmia of Infancy Before the Use of the Credé Method.

<i>Authors.</i>	<i>Number of Cases Observed.</i>	<i>Percentage of Ophthalmia Neonatorum.</i>	<i>References.</i>
Credé, Leipzig, 1874-80.	2266	9.97	Arch. f. Gyn., xvii, S. 50.
Grenser, Dresden.	2801	13.6	Haussmann, Deutsche med. Wochenschr., 1879.
Osterloh, Dresden.	1106	10.5	" "
Winckel, Dresden.	1029	15.4	" "
Ahlfeld, Marburg, 1867-82.	2191	5.2	Zeitschr. f. Geb. u. Gyn., xiv.
Haidlen, Stuttgart, 1877-80.	1476	11.65	Centralbl. f. Gyn., 1883.
v. Saxinger, Tübingen.	1980	6.1	v. Saxinger, Mittheil. aus d. geburtsh. gyn. Klinik zu Tübingen, 1884.
Dethlefsen, Kiel, 1872-82.	1212	10.31	Diss Kiel, 1885.
Dyrenfurth, Bresl. Hebammen-Anstalt.	1039	18.5	Haussmann, Deutsche med. Wochenschr., 1879.
Königstein, Wien, 1881.	1092	4.76	Allg. Wien. med. Zeitg., 1882
C. Braun, Wien.	290	7.2	Haussmann, Deutsche med. Wochenschr., 1879.
" "	260	4.0	" "
Artemieff, Tiflis, 1873-83.	1025	2.9	Arch. de Tocologie, 1887.
	17767	9.24	

It will be seen that previous to the introduction of Credé's method the record of over 17,000 births, tabulated by twelve observers, shows that over 9 per cent. of children developed ophthalmia neonatorum. On the contrary, after the introduction of Credé's method the records of over 24,000 births, by twenty-six observers, indicate only .65 per cent. In other words, the proportion was nearly fifteen times as large without the Credé method as with it. Attempts have naturally been made to obtain the same results with other agents and the relative success with these is shown in Kostling's list. It will be seen that all of these methods give a larger percentage of ophthalmia than does that of Credé's, with possibly the exception of solutions of sublimate. A digression might be

made here to show why this last treatment is inferior to that suggested by Credé. The stronger solutions—a tenth of one per cent., are very irritating to the conjunctiva, and obstetricians like Widmark, Fleischhauer and Olshausen, after extensive trials, have abandoned all sublimate solutions to return again to the nitrate of silver. Therefore, until the evidence of those who have used sublimate is more abundant and more favorable that must also give way, leaving no form of treatment with a record of efficiency equal to that of the 2 per cent. silver nitrate.

But are there not objections to the plan recommended by Credé? Yes; and if these objections are stated in turn, each with its full force, and the natural answer to it is considered, it will at once appear how weak these are in comparison to the reasons for still keeping to that method. The first and most important objection is the mere doubt in the minds of some, as to whether or not a two per cent. solution of silver nitrate may in some way be harmful, possibly dangerous. The simple reply is that it is not. When a single drop of the solution is used, as recommended by Credé, the procedure is practically as free from danger to vision as any treatment can be.

The fact is, that among the 24,724 records of births collected by Kostling in which the obstetricians have used the two per cent. solution of silver nitrate, and among the many more thousand births, probably, in which the same solution was used and in which any bad results would have been promptly published if they had occurred—among all these it is possible to find reference to four cases only in which any disagreeable effects could be attributed to this method. It should be remembered also how much care has been given to ferreting out any such cases of injury from the silver nitrate.

For example, in order to gather data on this point (as well as on others relating to ophthalmia of infancy) Cohn sent a letter to the leading ophthalmologists of Germany asking, among other questions, if any unfavorable results from the use of Credé's method had come under their observation. He received replies from one hundred and ten of the heads of ophthalmological clinics and others with whose names we are most familiar, and among them all discovered two cases in which there was even a question as to the disadvantages of the method. In both of these it was asserted that ulceration had followed the application of "drops" immediately after birth, but in neither instance was it possible to ascertain the strength of these drops nor how often they had been used.

TABLE II.—Statistics Concerning the Frequency of Ophthalmia Neonatorum After the Use of the Credé Method.

Authors.	Number of Cases O served.	Percentage of Ophthalmia Neonatorum.	References.
Credé, Leipzig.	1160	0.086	Arch. f. Gyn., xxi.
Zweifel, Leipzig.	1724	0.2	Lehrb. d. Geburtsh. III Aufl.
Leopold u. Wessel, Dresden.	1002	0.69	Arch. f. Gyn. xxiv.
" " "	1100	0.0	Centralbl. f. Gyn., 1885.
" " "	522	0.0	Arch. f. Gyn., xxiv.
Brose, Berliner Frauenkl.	460	1 5	Zeitschr. f. Geb. u. Gyn., x.
Gusserow, Charité.	1110	0.45	Korn, Arch. f. Gyn., xxxi.
Hummerich, Charité.	1007	1.39	Ref. Centralbl. f. Gyn., 1885.
Haidlen, Stuttgarter Hebammenschule.	978	0.1	Centralblatt f. Gyn., 1883.
Bayer, Stuttgarter Hebammenschule.	361	0.0	Arch. f. Gyn., xix.
Krukenberg, Bonn.	703	0.56	" " xxii.
Kaltenbach.	234	0.85	Nebel, Zeitschr. f. Geb. und Gyn., xiv.
Feis, Gottingen.	452	0.0	Centralbl. f. Gyn., 1892.
Caro, Königsberg.	1254	1.44	Diss. Königsberg, 1887.
Beumer u. Peiper, Greifswald	109	1 7	Arch. f. Gyn., xxiii.
" " "	107	1.9	" " "
Karafiath, Budapest.	130	0.72	Ref. Centralbl. f. Gyn., 1884.
Königstein, Wien.	1300	Knapp 1.0	Allgem. Wiener med. Zeitg., 1882.
Felsenreich, Wien.	500	0.4	Arch. f. Gyn. xix.
" "	3000	1.93	" " "
Konrad, Grosswardein.	714	0.14	Ref. Centralbl. f. Gyn., 1889.
Artemieff, Tiflis.	153	0.6	Arch. de Tocologie, 1887.
" "	204	0 3	" " "
Mendes de Leon, Amsterdam.	870	0.8	Ref. Diss. Fleischhauer, Halle, 1884.
Rudin, Charité, Paris.	675	0.15	Arch. de Tocologie, 1892 p. 877.
Rivière, Bordeaux.	403	0.5	" " "
Vinay, Lyon.	400	0.0	Puech. Arch. de Tocologie, 1890, p. 72
Garrigues, New York.	351	0.0	" " "
Charles, Lüttich.	377	0.265	Ref. Centralbl. f. Gyn., 1888.
Fehling, Basel.	3002	0.19	
Fehling, Halle,	361	0.83	
	24723	0.655	

*One Per Cent. Solution of Silver Nitrate.*

<i>Authors.</i>	<i>Number of Cases Observed.</i>	<i>Percentage of Ophthalmia Neonatorum.</i>	<i>References.</i>
v. Hecker, München.	133	3.0	Arch. f. Gyn., xx.
Schmitt and v. Weckbecker Sternfeld, München.	1090	1.844	Centralbl. f. Gyn., 1883.
	1223	2.422	

TABLE III.—*Carbolic Acid Solution.*

<i>Authors.</i>	<i>Number of Cases Observed.</i>	<i>Percentage of Ophthalmia Neonatorum.</i>	<i>References.</i>
Königstein, Wien.	1541	2.0	Allg. Wien. med. Zeitung 1884.
Krukenberg, Bonn.	82	13.4	Arch. f. Gyn., xxii.
	1623	7.7	

*Sublimate Solutions.*

<i>Authors.</i>	<i>Number of Cases Observed.</i>	<i>Percentage of Ophthalmia Neonatorum.</i>	<i>References.</i>
Stratz, Berl. Frauenklinik.	965	0.6 (0.1 per cent. solution)	Centralbl. Gyn., 1895.
" " "	460	0.43 (0.02 per cent. solution)	" " "
Fritsch, Breslau.	486	0.4	Stratz, Centralbl. f. Gyn., '85.
v. Erdberg, Dorpat.	450	0.43 (Sublimate 1:7000)	Diss. Dorpat, 1892.
	2361	.47	



*Sterilized Water.*

<i>Authors.</i>	<i>Number of Cases Observed.</i>	<i>Percentage of Ophthalmia Neonatorum.</i>	<i>References.</i>
Abegg, Danzig.	2266	3.0	Arch. f. Gyn., xvii.
Schirmer, Erlangen.	50	0.5	Centralbl. f. Gyn., 1882.
Grünwald, Petersburg.	485	1.66	Monographic, 1884.
Kaltenbach, Halle.	85	1.176	Nebel, Zeitschr. f. Geb. und Gyn., xiv.
Cohn, Berl. Frauenkl.	200	4.0	Centralbl. f. Gyn., 1886.
" " "	653	1.9	" " "
Korn, Dresden,	1000	0.7	Arch. f. Gyn., xxxi.
" "	95	6.0	" " "
Hofmeier, Würzburg.	354	0.28	München. med. Wochenschr. 1890. (One case of corneal ulceration among these).
Mermann, Mannhein.	400	0.25	Centralbl. f. Gyn., 1892.
" "	200	1.0	" " "
Rivière.	45	17.0	Arch. de Tocologie, 1892, p. 877.
	5823	3.122	

*Iodine Trichloride.*

<i>Authors.</i>	<i>Number of Cases Observed.</i>	<i>Percentage of Ophthalmia Neonatorum.</i>	<i>References.</i>
Buchholz, Dorpat., I, 4, '92 bis I, 4, '93.	201	1.0	Diss. Dorpat, 1893.
Keilmann, Dorpat u. Breslau	500	1.4	Schles. Gesellschaft f. vaterl. Cultur., 25, 1, 1895.
	701	1.2	

From these tables it will be seen that we have here the results of various plans adopted in over 54,000 cases divided as follows:

## OPHTHALMIA OF INFANCY.

17767 births with no treatment, - - - -	9.2 per cent.
24724 births with 2 per cent. solution of silver nitrate,	0.65 per cent.
1223 births with 1 per cent. solution of silver nitrate,	2.4 per cent.
1623 births with carbolic acid solutions - - -	7.7 per cent.
965 births with 0.1 per cent. solution of sublimate,	0.6 per cent.
1396 births with other sublimate solutions, - -	0.4 per cent.
6155 births with sterilized water, - - - -	2.8 per cent.
701 births with iodine trichloride solutions, - -	1.2 per cent.

Two other cases have occurred in this country. One is published by de Schweinitz in the *Medical Record* of 1891, and the other by Pomeroy in 1887. Both of these presented the rather peculiar feature of bleeding following the application of the silver nitrate. In de Schweinitz' case a two per cent. solution was used first and after that one of four per cent. As this would never be applied by any one following the Credé method, it should be excluded from the present category. There remains only the case reported by Dr. Pomeroy. With this child only a drop of a two per cent. solution was used, but there followed "a slow persistent oozing of blood startling to observe." There is every reason to suppose that the child was one of those individuals with a natural tendency to bleed freely. Indeed, among so many thousand or even hundreds of thousands of children thus treated it would be strange if some such bleeding from a usually insufficient cause were not met with. It should be remembered also that nearly every remedy which has been proposed to take the place of silver nitrate has been followed by disagreeable results. Even after the use of sterilized water some irritation and, once at least, corneal ulceration has followed (Hofmeier), probably due as little to the water as the other cases were to the silver nitrate.

OBJECTION 2.—If not dangerous, it is at least painful. No, that is not necessarily the case. Since Credé's first article on the subject, cocaine has been given to us. Of course it is impossible to use cocaine first and immediately after apply the silver nitrate, as a precipitate would be formed, but it is possible to inject first a few drops of cocaine, and though the tears at once wash this out the anæsthetic effect remains and if the silver be used then the pain produced is but very slight.

OBJECTION 3.—The procedure does not invariably prevent the disease. It is true that in a very small percentage of children the remedy is ineffective and in spite of it they develop the disease. But that ratio, taken from a list of more than



24,000 cases, is 0.65 per cent. Is not that degree of efficiency quite as high as that of other drugs which we call specifics? With the same reasoning we would have to give up the use of opium, quinine and many of the most valuable remedies.

OBJECTION 4.—It requires extra care on the part of the obstetricians. But what is the obstetrician employed for, if not to give the child the best attention possible?

OBJECTION 5.—Some discomfort and possibly some pain is given to the children, with consequent anxiety to the parents.

In a word, the child is put to some inconvenience. But which would the child prefer—such inconvenience, or the possibility of life-long blindness? And as to the parents, they have only reason to congratulate themselves that a method is now known whereby we are assured the practical safety of so many of the eyes formerly sacrificed. These objections, then, resolve themselves into the question as to which is the worse, annoyance to the physician and to the children, or life-long affliction like this, though it be to comparatively few. It must be admitted that the method recommended by Credé is far from perfect and not always reliable. A better one may be found to-morrow, but thus far, in the opinion of those most competent to judge, it is the best. But admitting all this, and that Credé's method is the best, why should it be made obligatory, either by general State law or by local regulation?

There are several reasons for this. The first is the right which the State has to protect itself against unnecessary taxation. Children born in public institutions are specially under its care. It has as much right as an individual to say what treatment they shall have, and if Credé's method is the best now known, these children should invariably have the benefit of it. If a better method is discovered, as we hope it may be, it would be easy enough to change the regulation or the law.

Second, it is not only the right, but the duty of the State to compel the use of this one exclusive method of treatment—which experience has proved the best—for the same reason that it is its duty to enforce vaccination.

The danger from contagion is of course much less, but when we remember that these blinded individuals must be dependent almost invariably a whole life time for their support, the cost in the end is greater than that caused by small-pox.

A third reason is that obstetricians have shown themselves slow to adopt this or any other plan for the prevention of purulent ophthalmia. The truth is, as shown by May, that about as many cases of this disease are recorded in hospital reports now, as there were ten or fifteen years ago. There is also reason to think that some teachers of obstetrics do not lay sufficient stress on the necessity of preventive treatment.

Burnett says that "in more than thirty standard works on obstetrics in English in the library of the Army Medical Museum there were only four which considered the preventive measures of which we have spoken. These were the *Encyclopædia of Obstetrics and Gynæcology*, and the *Treatises of Barnes, Lusk, and Gazeaux and Tarnier*. In only six others—and they were mostly old works—was there any consideration given to the treatment of this disease when once it had been established."

In spite of all that has been written, many obstetricians still confess that they use such precautions seldom or never, and so children continue to increase the army of victims made blind by carelessness or ignorance. But it happens in certain instances that the practitioner is morally sure that no such source of contagion exists on the part of the mother, and it is naturally asked whether the child of such a mother should be given even a little pain or discomfort and the parents caused any anxiety by the redness of the eyes?

The reasoning is perfectly good. But in such a case it is better for the physician to take the responsibility himself, and pay the fine for breaking a law, if he must do so, than to have no such provision at all. Laws must be made for the average and not for exceptional individuals. It will be observed that the reasons given for making the method obligatory apply not only to public institutions but with equal force to private practice. That would be the logical result and I shall mention in passing the enormous advantage gained if the Credé method or some other equally efficient were thus made universally obligatory. For the present, however, it is better to attempt making this apply to public institutions only and for the following reasons:

First, it would probably be impossible to inaugurate such a universal system at once. The American citizen resents

paternalism in government and wishes to have his own children treated in his own way even if that is the very worst.

Second, if the method is established in public institutions first the laity will gradually learn its advantages and be apt later to ask that their children receive as intelligent treatment as is given to paupers.

Third, it is better to restrict the treatment to public institutions for the reason that an opportunity is still left in private institutions and private practice for experimenting with other methods, whenever the obstetrician is so inclined and the parents are willing to permit it.

It is true, that if Credé's method were made obligatory in public institutions only a very small part of the population would be affected by it, but if that led, as it probably would, to its universal adoption, it is easy to calculate how great the gain would be in the end. We have seen already that a moderate estimate places the number of blind from this disease in the United States at a little over 5,000, but if the Credé method or some other equally effective were invariably used, that number would be reduced in one generation to about 331, or say 350 at the outside. Now it is also shown by the reports of a large number of ophthalmic hospitals (Cohn) that when these cases, already fully developed but without ulceration, have the benefit of methods of treatment now well known, only about five per cent. of them progress to ulceration with consequent impairment of vision. It is probable that most of such cases would be seen in this early stage, not only because the attention of the public had been directed to the importance of the subject by this law, but also because there already exists another law which compels midwives to report these cases to some qualified practitioner soon after the condition is recognized. This latter law already exists in thirteen States having a population of over 34,600,000. If, now, in another generation only about three hundred children or less developed the disease at all, and if these received proper attention in so early a stage that only five per cent. of them had ulceration of the cornea, there would be, as is evident, not 5,000 cases as we have now, but only eighteen cases in the whole United States, with the corresponding lessening in suffering and cost. Of course this is but an estimate, and it makes but little difference whether it be eighteen or twenty-five, for the practical fact is

that an enormous reduction would be possible. So great would this be as practically to realize for this country what Cohn quotes from Prof. Dimmer as the concluding sentence of his recent exhaustive monograph on the subject, namely,—“purulent ophthalmia of infancy can and must be wiped out of every civilized country.”

So much for the advantage of Credé's method, and why it should be obligatory at least in public institutions. Two words more should be added concerning the attitude of the profession in regard to making it obligatory. One of these concerns the obstetrician and the other the ophthalmologist. As to the obstetrician, those who do use it in institutions would probably have no objection to making it obligatory there until some better method were found.

On the other hand, we often meet a practitioner whose experience is comparatively small, generally without the advantage of practice in institutions, who reports having attended a few hundred cases—number usually indefinite—during a certain period of years, and, having met with but one or two instances of ophthalmia of infancy, he demands indignantly why, for that small number, so many should be subjected to such great inconvenience. The evident reply is, that either his experience has been exceptionally fortunate, or that the bad results have been omitted or forgotten. The blind asylum too often has records of his cases, and obligations, legal or otherwise, should be imposed to control just the class of which he is a type.

Finally, it would seem that a great responsibility as to this question rests on ophthalmological societies and on individual ophthalmologists. For the one who places any obstacles in the way of this measure owes it to himself as well as to the profession to state clearly the reasons for this, if, indeed any can be found after he has really studied the subject thoroughly. The subject of the prevention of blindness from ophthalmia neonatorum has been carefully considered by the Ophthalmological Society of the United Kingdom, by the Ophthalmological Section of the International Medical Congress of 1890, and by the Société Française d'Ophtalmologie, and American practitioners in this department can not be tardy in calling the attention of their professional brethren to this much needed reform. I think, too, that even the evidence

which it is possible to produce in a brief sketch like this, is sufficient to show that if legislators will compel obstetricians in public institutions to employ this method invariably, it will prove to be the first step in a decided progress towards the relief of misery and the lightening of an unnecessary burden to the State.

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### CONGENITAL NYSTAGMUS.<sup>1</sup>

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PERSONS afflicted with congenital nystagmus occurring in conjunction with vision which is normally fair but for the spasm of the recti muscles, or which can by the aid of proper correcting lenses be raised to fair vision, may be greatly improved in personal appearance, and the nystagmic movements lessened or totally suspended by relieving the abnormal relation existing between the motor muscles of the eyes themselves, or between them and the soft and bony structures in which they are suspended. In a limited number of cases the correction of the errors of refraction, which have usually been high, have been sufficient to do away with the tremulous or oscillating movement.

My special interest in this class of cases arose in the following manner: In 1887 two children came to my clinic who were totally color-blind and nystagmic. The elder, a girl of 14, was very clever at sorting worsteds as to value, but totally unable to determine their color. The brother, 12 years of age, could not sort the colors, and was less accurate in arranging them in value. They had no errors of refraction, and their vision was about  $\frac{20}{XL}$  in good light. Their mother stated that they were noticed to have unsteady eyes soon after birth, but had had no illness except the usual attacks of colds and indigestion of childhood. They were blonds, but not albinos, strong, bright and healthy. The mother had taken them to

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<sup>1</sup>Read at the Second Annual Meeting of the Western Ophthalmological, Otological, Laryngological and Rhinological Association, held in St. Louis, April 8-9, 1897.



several physicians, seeking relief for the nystagmus. The prognosis had been so uniformly unfavorable that she had long ago despaired of giving them relief. And they were now consulting me for a slight conjunctivitis. The children did not know that they were color-blind, and I discovered it by accident.

These cases called to my mind the papers by Oglesby (*Brain*, 1880), and the criticisms of his conclusions by Snell.

The observations made by Snell of miners suffering from nystagmus, led him to the conclusion that acquired nystagmus was due, among miners and others, to the awkward and unusual position in which they were forced to place themselves while at work, and the long-sustained and unaccustomed position of their eyes during their shifts of labor, and not to functional or organic diseases of the brain. In my observations in cases of squint due to contracted or undeveloped check-ligament and the nystagmic movements which attend the effort to overcome the inhibition of the ligament, the irregular movement has been greatest at the extreme limit of forced abduction, and the eyes have been at rest, or nearly so, when favoring the contracted facia. In watching congenital nystagmic patients, it has been noticed that there is one position that their eyes assume, which affords them improved vision, and obtains comparative quiet. In all other positions the eyes move with greater rapidity, and longer and more irregular excursions. And in the extreme opposite position, the visual lines are widely removed from their habitual relation, and give the sensation of confusing diplopia and greater blurring of vision. It occurred to me that I might at least be able to bring the position of rest to the median line, correct the eccentric pose of the head, and, possibly, relieve the oscillating movements throughout the entire range. This I endeavored to accomplish, first studying the head and eye movements in all acts of seeing, determining their position of complete rest and acutest vision. Then studying the range of adduction, abduction and circumduction, and if present, rotation. This was done with the eyes used singly and together. To illustrate: Maggie C., aged 14 years, nystagmic from birth, with head posed to the left and eyes directed to the right, vision =  $20/XL$ ; head erect and eyes directed in front, vision =  $20/CC$ ; head to the right and eyes directed to the left, could not determine that there were



letters on the chart. Left eye covered, right eye exposed, easy and complete abduction, slow and partial adduction. At point of complete abduction the eye made slow and periodic excursions over a short area, at times the eye remained perfectly quiet. In adduction the rotation was large and rapid, the upward and downward movements were hesitatingly made. Right eye covered, left eye exposed, rotation in the whole range more irregular and spasmodic than the right; point of greatest quiet at complete adduction. Abduction could be made only to two-thirds of normal range. With this object in view, *to change the point of fixation and rest to the median line, and, possibly, by making this change arrest the spasm*, it was determined to tenotomize the external rectus of the right eye, and the internal rectus of the left. This was done, but with slight results. The rotation was less, and the point of rest was changed to 25 or 30 degrees to the right of the median line. Advancement of the right internal rectus and of the left external rectus was made, and the point of rest was carried to the left of the median line about 10 degrees. In this position the eyes were very quiet, but the habit of posing the head to the left was difficult to correct, and proved to be too great a strain upon the sutures of the left eye, for we had to introduce firmer ones on the second day. Two weeks after the first operation the eyes were as quiet in their new position as they had been in their former position of rest. Vision was good, the habit of posturing the head had been overcome, and the purpose of the operation, in part, attained.

The brother then submitted himself to the same study and treatment, with similar results. I saw the children twice during the following three months, each time there was noticeable improvement in the nystagmus. In 1890 the brother returned to the clinic, and reported favorably. Vision =  $\frac{20}{xxv}$ , no movement could be noticed when the eyes were in the front position, and but slight movement when making the lateral range. There was slight oscillation under the Graefe test for muscular insufficiency, and but 5 degrees of esophoria. He reported his sister quite as well as himself and having as good vision. It is needless to add that the color-blindness had not improved.

In 1894 the sister reported. The movements of the eyes were perfectly normal throughout the entire range, the vision

was  $^{20}/_{xx}$ . Vertical displacement gave 10 degrees of esophoria, which was corrected, as it gave double vision at times, especially when she was fatigued.

CASE 3.—Mary C. H., aged 17 years, 1889 First noticed irregular movements of the eyes in early childhood. The parents claim that the movements were slight at first, but increased as the child moved about, and that in trying to use her eyes she made violent movements; also was excited on going into strong light. At an early age they noticed that the child's head was turned to the right and bent forward; was not able to run about and play as freely as other children; in reading, held the book close to the face and moved the head in following the lines; movements of the hands accompanying close vision were slow and abnormally deliberate; complained of headache and bad spells, which I should call *petit mal*, once in four or ten weeks. These attacks had been more frequent during the past year. Just before the spells, had a buzzing sound in the ears and a flash of light before the eyes. These attacks occurred in the afternoon, and usually, following close application. Severe headaches followed the flash of light, when there was a lapse of memory and moments of forgetfulness. When the full-fledged spells occurred, she would be dull and listless for hours.

Examination: Nystagmus oscillating. Point of rest, extreme left abduction, with head forward and eyebrows elevated. Vision in right eye =  $^{20}/_{LXXX}$ ; left eye =  $^{20}/_{XL}$ . Head erect and eyes directed forward, vision =  $^{20}/_{CC}$ . The left eye could not be brought to the median line without covering the right.

Refraction: Compound hypermetropic astigmatism.

R. = + 2 D. ax. 180. V. =  $^{20}/_{XL}$ .

L. = + 2.50 D.  $\bigcirc$  + 3 cyl. D., ax. 180. V. =  $^{20}/_{XXX}$ .

The estimation of the error of refraction was unusually difficult. Glasses were given with full correction, and placed so that the patient could hold the head in position of easiest vision. Headache, *petit mal*, and indigestion were at once relieved. The eye movements did not change, and the asthenopia was less.

The year following, and the eighteenth of her age, we operated, correcting the hyperphoria, and later, the posing of the head to the side. Besides the tenotomy of the left superior, an advancement of the right inferior rectus was made. Before

perfect front placement was obtained, tenotomies of the right internus and tenotomy of the left externus were made. Later, advancement of the right externus gave front placement and rest with but slight tremor in any part of the range. Vertical displacement gave but slight unsteadiness of the eyes, and alternating heterophoria. The result was better than I expected so far as the nystagmus was concerned, but the experience of the first two cases made me confident regarding the ability to change the position of rest.

CASE 4.—Thomas —, aged 11 years, 1891. Mother noticed irregular movements of the eyes shortly after birth, but the physician assured her that all children did that way. At three months of age the movements became marked, and there was evidence of low vision by the twelfth month. All efforts at close-seeing were accompanied by awkward movements of the head and violent rolling of the eyes.

Examination: Vision =  $\frac{20}{60}$ ; head thrown back and eyes but slightly moving. Hypermetropia = 4 D. each eye; a small opacity of the position pole of each lens. Corrected error of refraction giving  $\frac{20}{40}$  vision. The visual acuity was so good that I did not advise operations upon the lens. The patient is now reported as being free from nystagmus in the lateral directions, but there remains slight rotation.

CASE 5.—Charles V., aged 14, 1891. Nystagmus from infancy. Head thrown back and directed to the right; mouth open and grimacing with every movement. Point of rest, eyes directed to the left and below the median line, vision =  $\frac{20}{100}$  each eye; myopia = 1 D. Nystagmus not benefited by use of glasses. Operated, advancing inferior rectus of the left eye, and corrected the lateral deviation by tenotomies and advancements upon the lateral recti muscles. The eyes were more quiet, but the patient found it difficult to overcome the habitual pose of the head.

One year later the patient reported, with head and eyes in anti-treatment position. Myopia increased to — 3 D. Under atropine remedies choroidal changes have taken place. The eyes do not seem as quiet in any position as they did before the operation. This condition is, I think, due to the lowered vision resulting from the choroidal changes, as vision only equaled  $\frac{5}{60}$ .

CASE 6.—Miss B. R., aged 8 years. Convergent strabis-

mus, nystagmic from birth. Vision, O. D. =  $\frac{11}{60}$ ; O. S. =  $\frac{20}{600}$ . Figure 1 will give you a better impression of the child than I can by description. Head turned to the right and directed



FIG. 1.



FIG. 2.

forwards. Left eye fixing at  $40^\circ$  convergence and almost quiet; right eye-converging and very tremulous. Correcting glasses were given with vision =  $\frac{20}{300}$  and graduated tenoto-



FIG. 3.



FIG 4.

mies made upon both the recti muscles. The result obtained as in Figure 2. Nystagmus completely relieved.

CASE 7.—Mr. P., aged 19 years. Nystagmic from birth, had also general incoordinate movements in walking and general hand movements. Figure 3 will show the habitual pose of the head, but nothing can give an idea of the general results of a movement of either the hands or feet. Vision could not be markedly improved by glasses, but by making tenotomies and advancements, I attained the straight-ahead position (Fig. 4), with marked improvement in visual acuity and lessening of the general incoordinate movements. He was able to use the typewriter with reasonable speed, play the piano, and learn some of the steps in dancing, which were executed with ease and grace. Eccentric movements of the head and incoordinate movements of the hands and feet are among the noticeable results or accompaniments of nystagmus, and are often relieved by the correction of the muscle tremor or spasm.

The remainder of the cases I will group as follows:

#### ALBINOS—FOUR CASES.

CASE 8.—Mary M., aged 12 years. Oscillating nystagmus, fixation upwards and to the right. Vision =  $^{10}/_{cc}$ . Myopia not benefited by glasses, and not advised to undergo treatment.

CASE 9.—L. K., aged 4 years. Dark glasses and advised to return for study two years later.

CASE 10.—John McC. Oscillating nystagmus, fixation and point of rest at left abduction; right eye did not follow; left, vision =  $^{20}/_{LXXX}$ , improved by a + 1.50 cyl., ax. 90, vision =  $^{20}/_{XXX}$ . Operated, to secure central fixation, with good results so far as the left eye was concerned, but the right eye soon relapsed into its old independent position, and was not again interfered with. The glasses given in this case were made of two layers of glass, one clear and correcting the astigmatism, and covered with a perforated disk of dark "London smoke" glass, which acted as a diaphragm excluding the side light. This device allowed prolonged work in a strong light; the patient was a draughtsman.

#### AMBYLOPIA DUE TO UNDEVELOPED OR DISEASED RETINAS, OPTIC NERVES, OR CENTRAL DISTURBANCE OF THE VISUAL FUNCTION.

*First Group.*—Six cases where one eye had vision which was, or could be raised to, or above  $^{20}/_{LXXX}$ .



CASE 11.—Oscillating nystagmus, both eyes converged; contraction of internal check-ligament. O. D., vision =  $\frac{20}{\text{CXX}}$ . With correcting glasses vision =  $\frac{20}{\text{XL}}$ . O. D., vision =  $\frac{3}{\text{CC}}$ , not improved by glasses. Limited abduction of both eyes, violent nystagmic movements attended all movements out of point of rest. Operations: Retraction of orbital fascia, guarded tenotomies of internal recti. Result: Good cosmetic effect and rest at front fixation.

CASE 12.—Oscillating nystagmus. Right eye fixing. V. =  $\frac{20}{\text{CXXX}}$ ; rest point in front position. Correcting glasses gave vision =  $\frac{20}{\text{LX}}$ . Left, perception of light only, wandered about independent of its fellow. With the correcting glasses + 2.50 D. first, and later an added correction of + 50 cyl. ax. 90, the eye became quiet, and only the slightest tremor could be noticed at any point of the field of rotation.

CASE 13.—Oscillating nystagmus, not benefited by glasses. Vision =  $\frac{20}{\text{C}}$  in the left eye,  $\frac{20}{\text{CC}}$  in the right. Left eye converged and was used in right field of vision; right eye converged and was used in the left field of vision; but slight movements at points of greatest rest. Operated both eyes and obtained good front position of rest, but could not secure coincident binocular vision. This case relapsed so far as the right eye was concerned, and we gave up further treatment.

CASE 14.—Mixed nystagmus. Left eye undeveloped, lid aperture small, lid movements slow and not corresponding to the right; no point of rest. Vision = perception of light and the passage of shadows. Right eye and side of face normal in development; vision =  $\frac{20}{\text{LXXX}}$  with + 2.50, ax. 90 =  $\frac{20}{\text{XL}}$  at point of rest, which was to the nasal side and above the median line. As the patient closed the left eye most of the time, and preferred not to have it disturbed; the right eye was operated by retracting the ocular fascia and advancing the externus. This secured good front position with almost complete rest of the eye in all proximal acts of seeing.

CASE 15.—Male, aged 28 years. Rotating and vertical oscillating nystagmus. Left eye amblyopic. Right eye, V. =  $\frac{20}{\text{CXX}}$  with head forward and slightly to the left. The mouth was always open, and the alæ of the nose dilated when looking intently at any object. Vision = (— 2. D.)  $\frac{20}{\text{XXX}}$  in position of rest. The rotating movement disappeared after using the glasses for a week, and the eyes were quite steady in the rest



position. A tenotomy of the superior rectus of the right eye placed it in the normal position, and all movement ceased. The left eye remained recumbent across the palpebral aperture and could only be directed forward by forced abduction with fixation forceps. The exposed conjunctiva was a beefy-red. There was an extensive posterior staphyloma with apparent thinning of the scleral walls. For cosmetic effect and to remove an offending member I advised enucleation. I have tried, but failed to secure a photograph of this patient, for the change secured is better seen than described.

CASE 16.—Right eye fixed and immobile; lids partially closed; right side of face expressionless and slightly brawny; left eye oscillating and jerky. Vision at times =  $\frac{20}{XL}$ , at others when the spasm was more irregular,  $\frac{20}{CC}$ . A form of irregular spasm of all the face muscles. The position of rest was not located. Refraction of right eye = 4. D.  $\frac{20}{XL}$  under atropia, but glasses were not worn. Did not attempt operative interference, for I was confident that the case was of central origin.

AMBLYOPIA AFFECTING BOTH EYES, BRINGING THE CORRECTED VISION BELOW  $\frac{20}{CC}$ ; THREE CASES.

CASE 17.—Patient, aged 9 years. Mixed, irregular nystagmus; corneal opacity and irregularity from birth; eyes painfully sensitive to light; lids small and tightly drawn over the diminutive globes. Vision could not be improved. There was no uniformity of movement, and the eyes were, at times, directed upwards for a moment before attempting to fix the object to be seen.

CASE 18.—Patient, aged 7 years. Eyes apparently normal in every way with the exception of rotary nystagmus. Vision =  $\frac{6}{CC}$ . In strong light pupil normal in reaction, could not see to read; no point of rest. Vision could not be improved. No attempt was made to correct the error.

CASE 19.—Patient, aged 11 years. Rotary and irregular oscillating nystagmus; vision could not be raised above  $\frac{4}{CC}$ ; irregular corneal astigmatism; no history of inflammatory disease; corneal transparent. Point of rest was located in the right upper field, but the rotation at this point was not materially less.

The conclusions to be drawn from the study of these cases reported, may, I think, be stated as follows:

1. Congenital nystagmus may be due to amblyopia from any cause, or from ametropia.
2. Congenital nystagmus may occur in atypic development of the eye and its appendages, and be due wholly or in part to the exhaustion or irritation of the motor oculi muscles or their nervous centers in their attempt to coordinate with the other acts of vision.
3. In treating cases due to amblyopia from errors of refraction, the correction of the errors may lessen or completely cure the spasm.
4. Those cases which are due to amblyopia from other causes than errors of refraction may be relieved directly as the cause of the amblyopia can be removed.
5. The causes which are due to atypic development of the eyes or their appendages may be relieved so far as we are able to properly establish them in normal relation to each other and their surroundings.

The remedies of science in my hands have been, first, carefully correcting errors of refraction and the placing of the correcting glasses in the best position to secure the best vision; second, training the eyes to perform their ranges of rotation with the head fixed; third, operations upon the recti muscles to secure full abduction, adduction and central fixation with eyes at point of greatest rest.

#### DISCUSSION.

DR. TIFFANY.—This is a subject which we are as much interested in as any. In most of the cases I have had it was due to congenital cataract, anterior or posterior polar cataract. When no such affection is present, it must be due to some heterophoria, some insufficiency of the extrinsic muscles of the eye and as the Doctor said, the treatment should be directed to the correction of that. I think, however, that it may be done with gymnastic exercises, with prisms and without surgical interference. In the case of albinos, of course, there is nothing to be done unless by use of the stenopæic disc. I have found that in rotary nystagmus the trouble usually is in the oblique muscles, whereas the horizontal form is due to esophoria or exophoria and the vertical is due to hyperphoria or kataphoria.

DR. FRYER.—I want to ask the Doctor whether he has

found in any of his cases a double fixation as the cause of the nystagmus. The most frequent cause of this condition, I believe, is not originally the muscular trouble, but some condition of amblyopia, and in the effort to fix the object the spasm of the muscles is brought about as a secondary matter. I should also like to ask the Doctor if he has been able, from his studies, to state which cases are operable and which are not.

DR. COLBURN.—So far as the double fixation is concerned, I have noticed that many times, and when the vision was equal in both, the use of the right eye in the left field and of the left eye in the right field. I think the trouble lies very largely in the capsule, tendon and check-ligament. The amblyopia is undoubtedly a great cause, and in so far as that can be relieved we can hope to benefit the cases. Most of the cases are due to structural changes of the fascia. In the albinos the condition is due to lack of pigmentation, etc. We can often get great benefit from the use of stenopæic glasses, and I have used a little disc for correcting the refractive error putting it upon the glass or set in a very dark smoked glass. Sometimes among my poorer patients I have shown them how to Japan their glasses. This is exceedingly useful in appropriate cases.

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### OPHTHALMIA NODOSA.<sup>1</sup>

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BY GEORGE KNAPP, M.D., VINCENNES, IND.

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PROFESSIONAL and natural pride kindles at the thought that, in the near future, the science of human life will present a highway of certainties such as now welcome the earnest and competent student in the study of the largest of the natural sciences.

I am not unmindful of the barriers which sacrifice, labor and skill must surmount before there can be a full realization of such a condition, the complexity of the subject matter, inviting as it does, constant investigation—rewarding the zeal-

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<sup>1</sup>Read at the Second Annual Meeting of the Western Ophthalmological, Otological, Laryngological and Rhinological Association, held in St. Louis, April 8-9, 1897.

light on pathways and in caverns heretofore enveloped in doubt and darkness., but the kiss of the friendly light, which bestows upon the searcher an intelligent understanding of his surroundings, reveals the existence of other recesses and mysteries, *unexplored*.

The living human body is, in both its natural and indwelling forces, the most complicated mechanism to be found within the realm of knowledge, and, this most complex of all things, is presented to us, in our practical duties, in an almost infinite multiformity. In practice, we are occupied, not with a type and pattern of human nature, but with all its varieties in all classes of men, of every age and every occupation, in all climates and in all social states; we have to study men singly and in numbers, in poverty and wealth, in wise and unwise living, in health and all the varieties of disease; and we have to learn, or at least try to learn, the results of all these conditions of life, while in successive generations and in the mingling of families, they are heaped together. In every one of all these conditions man, in habit, mind and body must be studied by us; and every one offers some different problem for inquiry and solution.

Wherever our duty, or our scientific curiosity, or, in happy combinations, both may lead us, there the material and there the opportunities for separate original research will be found.

Each and every one of us, who fully appreciates the importance and the magnitude of his work, encountering as he must, new difficulties at every turn, feels that he is an explorer in the forests and on the great plains of human life, seeking additional help for the rescue of pain-stricken humanity. Armed with the experience and wisdom of the past, he strives with might and main to add to the treasures, bear them onward to the last step which ends at his grave and cast them with loving hope into the glowing bosom of the future. So we meet here and now as explorers in the boundless domain of knowledge, to reason together, to compare notes of the regions through which our weary feet have passed, to frankly admit our mistakes, to acquaint each other with our professional triumphs, and to aid each other in the construction of safeguards and the strengthening of the weakened ramparts of life and comfort, against the fatal assaults of injury and disease.



I am expected to say something upon the subject of *Ophthalmia Nodosa*.

I can not promise you that my offering will prove either entertaining or serviceable to you, or to the profession at large; and, perhaps, the only value which may attach to my utterances, will be the spirit of candid sincerity in which they are expressed.

You may know quite as well, and perhaps, far better than myself, how very meagre the literature of our profession upon this subject is, and I do not even pretend familiarity with what has been written.

In my clinical and hospital work, both in this country and in Europe, not a single case came under my observation, but in my practice within the past year, I am convinced that three patients were the victims of this malady, and for those who may be interested in hearing a brief recital of them I will now proceed to state each case, so far as I am able to do, together with the actual results obtained:

June 26, 1896, Irwin C., aged 22 years, and a farmer by occupation, presented himself at my office for treatment of the left eye. He informed me that some days prior to that time, while climbing a cherry tree, a falling body, which he believed to have been a caterpillar, struck him in the eye, and that almost immediately following the reception of the stroke an intense itching, burning and smarting ensued, and which was closely followed by great swelling. He further stated that the only cessation of the sufferings which he experienced was during the application of very cold water.

Owing to intense photophobia I was compelled to cocaine the eye before the lids could be separated sufficiently to admit of an examination. When this had been accomplished, I found both palpebral and ocular conjunctiva greatly inflamed, with marked ecchymosis and a hazy cornea. I made the usual examination for foreign bodies in the cornea and finding none, decided that it was a traumatic, infectious disease and treated it accordingly.

On July 2, all pain having subsided, I made another examination and found the conjunctiva almost normal, with slight extravasation at sclero-corneal margin, nasal side; vision,  $\frac{20}{XL}$ . Right eye,  $\frac{20}{XL}$  with  $+ .75$  cyl. ax.  $60^\circ = \frac{20}{XX}$ . Glasses did not improve the vision of the affected eye.

After an absence of three months, he returned for treatment. During that period, according to his statement, the eye had suffered greatly from repeated attacks of acute inflammation, all of which had partially yielded to antiphlogistic treatment except the last attack which had kept him in a state of torture bordering on frenzy.

I again made an examination and found photophobia with profuse lachrymation, a diffuse infiltration of the cornea and the lower half vascular. The iris discolored with multiple posterior synechiæ, adherent to the lens capsule. Near the center of the temporal ciliary border of the iris I discovered a prominent nodule of a gray, or reddish gray color. Behind the iris on the temporal side, was discernible an iridocyclitic exudate, slightly vascular, and three dark, gray nodules in the episcleral tissue, unmovable. Tension — 1. Vision, fingers at 5 feet.

September 27, I extirpated the episcleral nodules, hardened them in Miller's fluid, stained by Gabbet's method, and the microscope revealed quite a number of giant, round and epithelial cells and also the horizontal section of a hair, cortical layers a dark-yellow and a light medullary substance,—the margins denticulated similar to that of a caterpillar hair.

October 6, I removed that portion of the iris which contained the nodule which, for want of time, was not subjected to microscopic examination. Treatment: atropine, unguentum cinereum.

The last time I saw the patient, which was on the 28th of the following month, the general condition of the eye was much improved. Vision  $\frac{6}{xxxvi}$ .

CASE 2.—September 20, 1896, James B. presented himself for examination and treatment of the right eye. He informed me that two weeks prior to that time the eye became inflamed, with slight pain, but accompanied by an itching and burning sensation in the member which was sensitive to light.

On examination I found the cornea, iris and vision normal. The palpebral conjunctiva and transition folds presented a vivid, red, smooth surface with the conjunctiva bulbi slightly injected. The subjective symptoms were itching, burning, photophobia and copious lachrymation.

The examination and history of the case induced the belief on my part, that the inflammation was catarrhal in its



character and the remedy employed was one-half per cent. solution of nitrate of silver.

On October 4, the patient returned and stated that the eye was much improved. Examination revealed the fact that the left eye was in no manner affected. The vision of the right eye was  $\frac{6}{VI}$ , with slightly increased lachrymation and photophobia; the palpebral conjunctiva was much improved, while the injection in the ocular conjunctiva was more pronounced, with three small excrescences.

In the light of these symptoms my diagnosis underwent a most radical change. Treating it as a case of ophthalmia nodosa, I extirpated the nodules and on examination found in two of them, hair fragments. In the treatment I employed atropine, cold compresses and a solution of boracic acid and the trouble readily yielded.

My opinion at this time is, that if on examination of the conjunctiva, I had brought into requisition lateral illumination and loupe, I would have discovered and extracted the hairs and as a consequence, would have conquered the ailment at the start.

CASE 3.—September 27, 1896, Miss B. came to my office for treatment of an eye. She stated that a couple of days before her sister threw a caterpillar which struck her in the eye. Burning, itching and pain followed. Observing that the eye was very sensitive to light I used a four per cent solution of cocaine four times within a space of twenty minutes.

On examination I found the eye highly inflamed and the cornea slightly injected. Aided by lateral illumination, I made careful search for foreign bodies, but found none. I then applied three leeches and instilled atropine. Two days later, by the use of lateral illumination and the loupe, I discovered two caterpillar hairs in the cornea and four in the ocular conjunctiva, which I scraped out with a foreign-body needle. This operation was followed by considerable reaction and increased lachrymation, which lasted about forty-eight hours and during which time I used "Kalt's douche" twice a day. On October 22, the eye was free from inflammation and the vision  $\frac{20}{XX}$ .

My humble opinion is, that in all cases where the history is vague and uncertain, but where the symptoms and indications suggest to the mind of the practitioner, ophthalmia

nodosa, that resort should be had to the microscope, as that alone can enable one to make a positive diagnosis.

It was acutely said by Montaigne, I believe, at one time, that it was the good fortune of physicians that the sun illuminated their successes and the grave covered their faults. But this is no longer true. The sun of investigation and research develops our blunders now in the full glare of day and the grave is made to yield up its every secret, while the advance guard in our own profession holds our errors up to the public gaze and mercilessly flails the lagging and indolent member who ignorantly and carelessly brings injury to any member of that sublimely intricate mechanism called the human body.

#### DISCUSSION.

DR. COLBURN.—During the last year one of the gentlemen of our Society reported a case similar to this and it was the first case I had ever seen,—at least the first I ever recognized. Last year a case occurred in the child of one of my neighbors, and in that case we were able to demonstrate the hair on the conjunctiva before it had penetrated very deeply, so it was removed; but one was penetrating the cornea and lay partially in the anterior chamber. This caused the most serious and provoking irritation that I have ever seen in the eye, and it was only relieved by passing the keratome through the cornea and removing the hair. I never saw a patient suffer such intense pain from a corneal irritation for four or five hours than this little girl did. One or two of my confrères were called in to see the case.

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### CAN CASTRATION AND OVARIOTOMY CAUSE OPTIC ATROPHY? REPORT OF TWO CASES.

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CASE 1.—Miss L. G., aged 41, wash-woman. A year ago had both ovaries removed for ovarian tumor by Dr. J. G. F. Holston, of this city. Tumors had been growing for six years. Says that immediately after the operation she became

quite deaf in both ears, also has noticed trouble with vision ever since. Says she never had any deafness or defect in vision. R. E., retinoscopy shows + .75 D. sp.  $\ominus$  — .25 cy. 180. L. E., + 1.25 sp.  $\ominus$  — .5 cy. 15. V., types, R. E., glass found =  $\frac{6}{x}$ ; L. E. =  $\frac{6}{x}$ . V. =  $\frac{6}{x}$ . Ophthalmoscopic examination, R. E., papilla hazy on inner half and very pale throughout and slight cupping. Retina very pale. Veins enlarged and tortuous. L. E., same condition as right but disc much paler. Visual fields not examined. Hearing: Grubers and Rinne's tests show both auditory nerves affected. Tests also show catarrhal deafness of both ears. It is hard to determine whether deafness is only partially the result of catarrh, or whether is due partially to primary disease of auditory nerve. Patellar reflexes normal, no disease of brain or spinal chord, rheumatism or kidney disease. No glaucoma. Disease of both auditory and optic nerves may have been in existence before ovariectomy was done. The great flow of blood to the ovarian tumors may have drained the blood from the auditory and optic nerves, so as to have impaired their nutrition and caused atrophy. We know that ovarian tumors may cause melancholia through malnutrition of brain. So also do we know that menorrhagia, post-partum hæmorrhage, etc., may cause optic atrophy.<sup>1</sup> So also do we know that reflex disturbance by causing either hyperæmia or anæmia of optic nerves or visual centers may produce disease of optic nerves.<sup>2</sup>

Now, if her statements are correct (that is, that she was not blind or deaf before operation), then we may safely conclude that the removal of the ovaries produced some reflex disturbance—either anæmia or hyperæmia—which resulted in disease of both auditory and optic nerves.

CASE 2.—This case is a young colt, 8 months old, which was castrated several weeks since. Its vision before this has been perfect, to all appearances. About ten days after castration it became totally blind. Upon request of its owner I made an ophthalmoscopic examination and found pupils widely dilated and feebly responsive to light. Both eye-grounds showed both arteries and veins very fine and thread-like. Discs very

<sup>1</sup>Bowman Lecture, Oph. Rev., Vol. VI.

<sup>2</sup>Ibid.

pale and cupped. The veterinary in charge says that otherwise the colt is perfectly sound.

I conclude that castration has produced same reflex disturbance which has caused total optic atrophy of both eyes. I recommended the glonoin and strychnine treatment.

REMARKS.—I have searched considerable literature and find no similar case.

Power<sup>3</sup> says: "The precise mode in which menstrual function operates in inducing ophthalmic disease is obscure. It may be by retaining in the blood, in cases of sudden suppression of the menses, and in cases of amenorrhœa more slowly induced, materials that are of a poisonous nature, the action of which is indicated by the loss of blood making power, and consequent imperfect performance of other functions, with spasms and pain in different regions of the body, in which the eye participates; or, it may be by acting on the blood-vessels of the eye alone through the nervous system in a reflex manner, and thus interfering with its due nutrition, as we know may occur in cases of dental disease and the intestinal irritation of worms."

Masturbation, sexual excesses, uterine diseases are other reflex neuroses that affect the optic nerves. The question as to whether castration and ovariectomy can cause blindness or deafness is a new and very interesting one.

The proposition now before the public and which the Kansas Legislature is now debating—as to the castration of criminals may be an excellent one and should it be adopted we will have an opportunity to study the effects of castration on the eyes. It is to be hoped that some enterprising ophthalmologist may collect statistics on the effects of ovariectomy on the eyes, if any.

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<sup>3</sup>Bowman Lecture, *Oph. Rev.*, Vol. VI, page 367.

## CLINICAL MEMORANDA.

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### A CASE OF COMPLETE URÆMIC AMAUROSIS.

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ON MAY 1, I was called by Dr. S., to see Mrs. F., who was suffering with uræmic convulsions. I found her pregnant, as she supposed eight and a half months; totally blind, with urine almost solid with albumen. She had been suffering for several days with severe headache. In the afternoon of May 1, about 4 o'clock, she complained of dimness of vision; about 8 o'clock she had convulsions, and by the time she was quieted she could see nothing.

On examining the eyes, I found the pupils reacting freely to light. After the use of a 4 per cent. solution of cocaine I examined, with the ophthalmoscope, finding the following conditions: Marked oedema of both discs, with passive congestion of the whole retinae; the veins very large, numerous and tortuous; the fundi had a smoky appearance throughout their entire extent.

There was such complete blindness that the patient could not see a light held within eight inches of eyes. Patient was delivered with forceps, and remedies were used to relieve the uræmic poisoning. She remained perfectly blind until about 9 o'clock P.M., of May 2, when she could point out the direction of a bright light held near. At this hour the amount of albumen in the urine was reduced about one-third. On May 3, at 9 o'clock A.M., she could see well enough to distinguish her husband. Ophthalmoscopic examination at this time showed a diminution of all symptoms. Three days later, when there was scarcely any trace of albumen in the urine, she could read No. 1 J. with but little difficulty.

The interesting point in this case is the complete absence of typical albuminuric or hæmorrhagic lesions of the fundi associated with perfect blindness of thirty hours' duration followed by complete recovery in so short a time. The cause of such complete amaurosis can not be due to the retinal changes.



Often we see fundi which show marked lesions and still retain good vision. We cannot refer it to any disease of the optic nerve. If this had been so severely affected optic atrophy would have followed. No such rapid recovery could have been possible with lesions of the nerve or retina of so severe a type as to cause complete blindness of thirty hours. I think that the condition was caused by temporary poisoning of the cortical centers of vision by the excess of urea in the blood. In support of this supposition I refer to the immediate return of sight as soon as the albumen began to disappear.

The prognosis in all complete amauroses should be guarded. To tell the patient that they shall never see again certainly would be depressing, but to tell one they would not, and in five days they could read, would be rather depressing to the physician, and the patient would doubt whether his opinion was worth paying for.

In making a prognosis, we must look well to the cause of the amaurosis. If this be within our control, we may give a favorable prognosis; provided there be no lesions sufficiently serious to protract the blindness, and also provided the pupils act freely to light. If the pupils fail to react to moderately strong light, I certainly would give a guarded or unfavorable prognosis.

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## BOOKS AND PAMPHLETS.

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**EYE-STRAIN IN HEALTH AND DISEASE.** By A. L. RANNEY, A.M., M.D. Thirty Wood Engravings. The F. A. Davis Company, Philadelphia. 1897.

In this book Dr. Ranney, the well-known supporter of Stevens' theory: that eye-strain causes innumerable and varied nervous affections, has collected his articles and reports which from time to time have previously appeared in different medical journals. It is interesting reading even for those whose results and experiences have never, or only once in a while, reached the high order, which almost invariably seems to have been the doctor's good fate.

The publishers' work is well done.

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